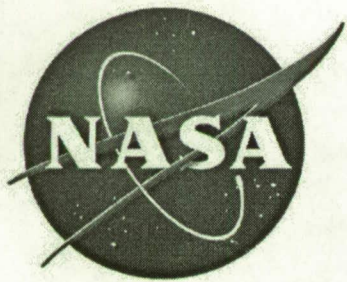


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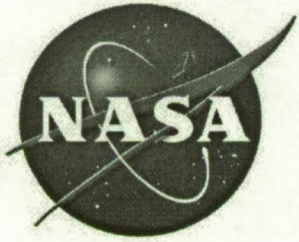
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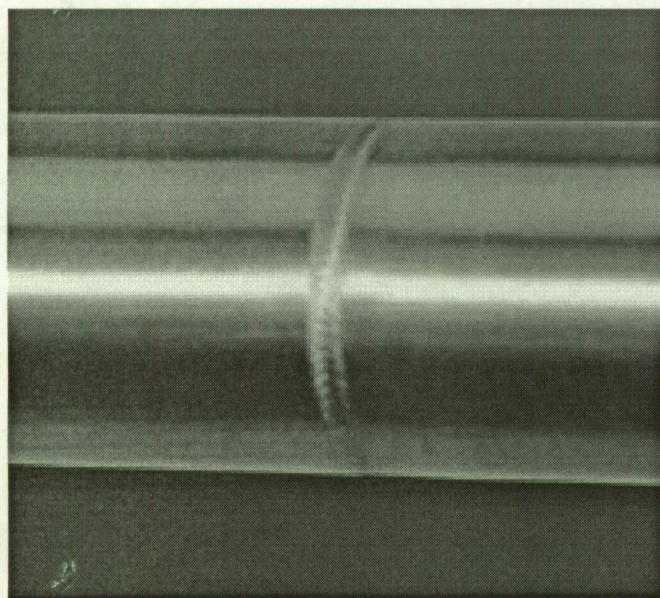
Developing NDE Techniques for Orion Crew Module

Don Parker
NASA KSC

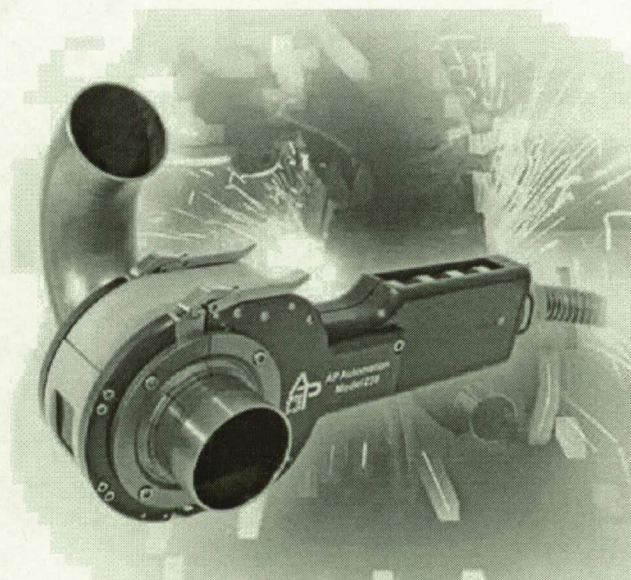


Project:

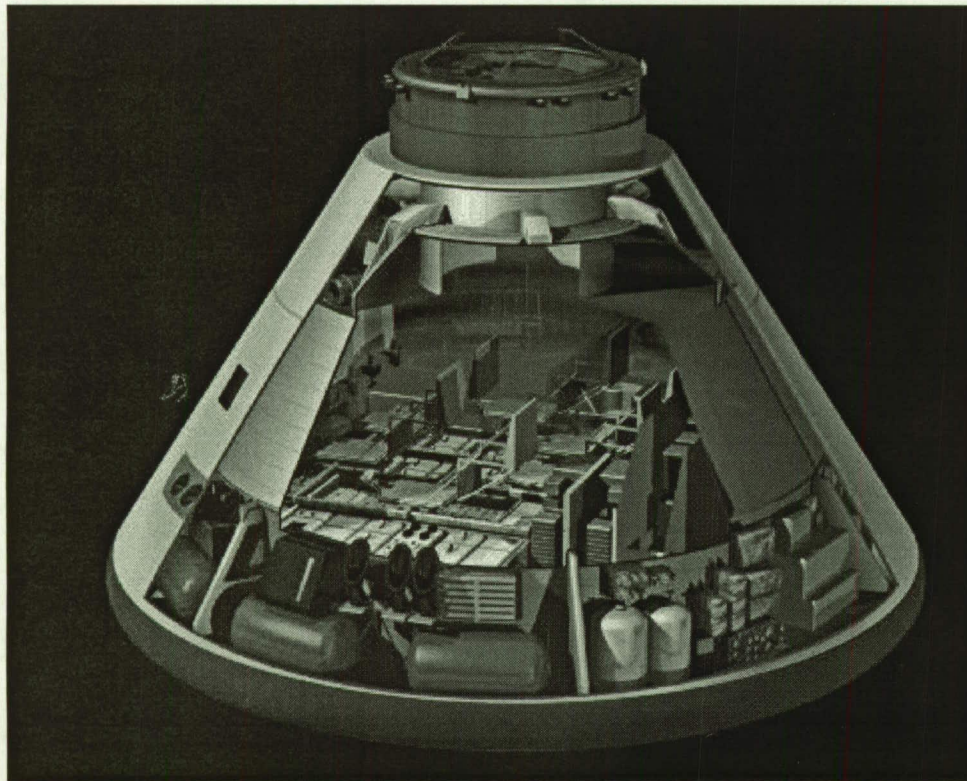
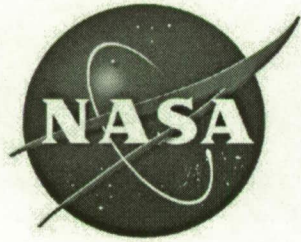
The Orion Crew Module (CM) and Service Module (SM) subsystems will require approximately 870 tube welds to be fabricated onsite at KSC O&C High Bay. A quick and reliable NDE technique is required to ensure efficient assembly and superior weld quality.



Typical example of an
orbital arc weld tube joint



Equipment used to make
orbital tube welds

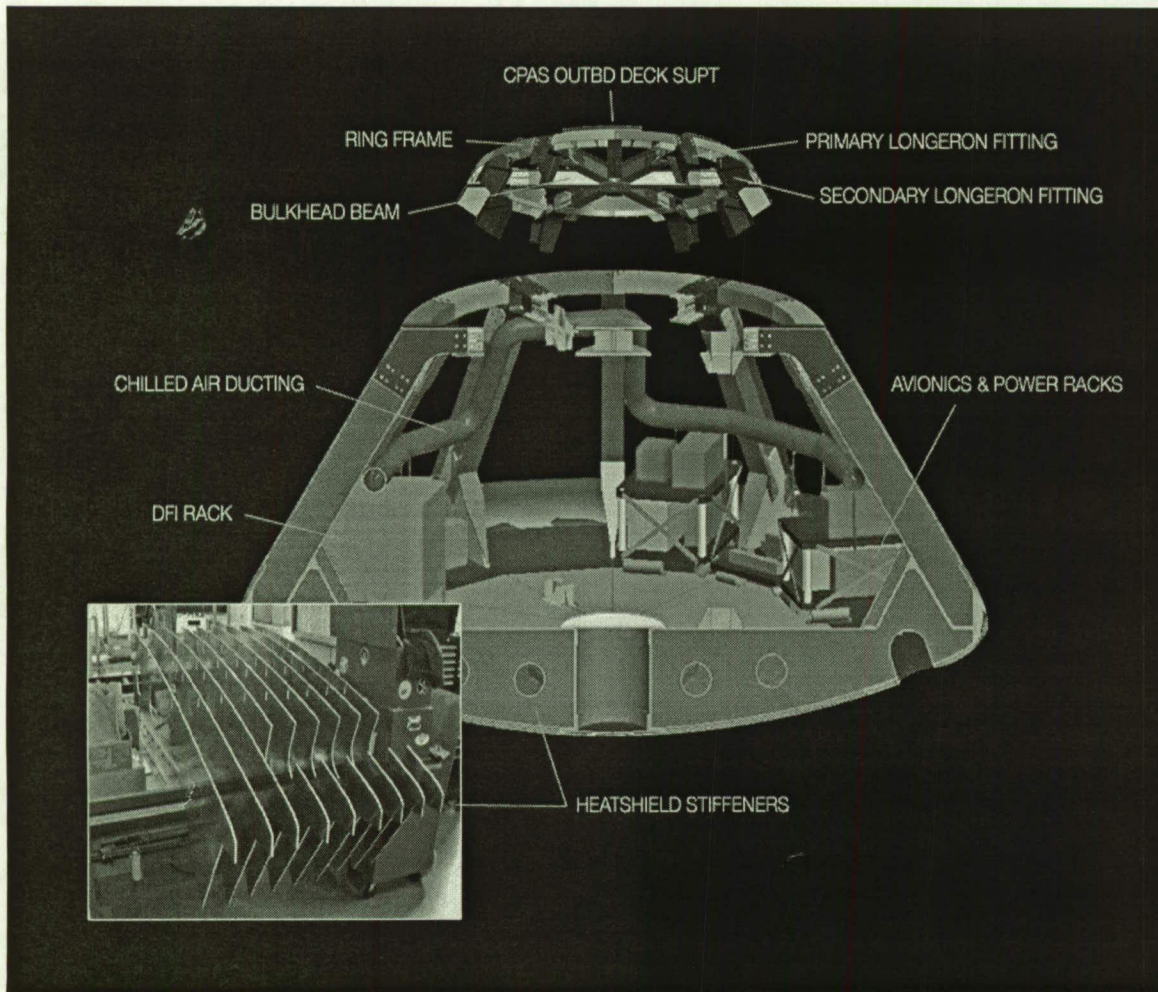
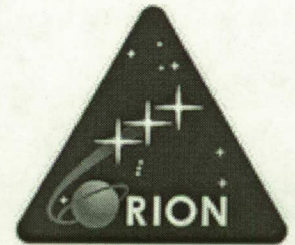
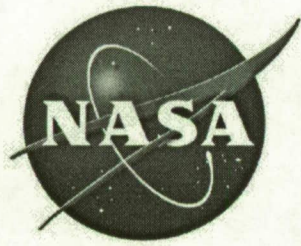


Orion Crew Module

-The Orion Crew Module will have approximately 870 orbitally arc welded tube joints throughout its interior.

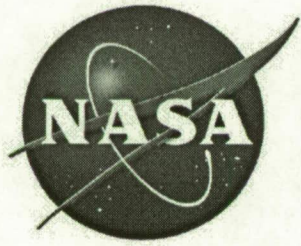
-Material will range from Ti to Inconel and Monel.

-Tube outer diameters will vary from $\frac{1}{4}$ " to $1 \frac{1}{2}$ "



-Tubing will vary in use from Structural, Pneumatic, and Electrical servicing.

-An efficient method of Non Destructive Evaluation is needed to inspect these welds in-process and to digitally record the results.

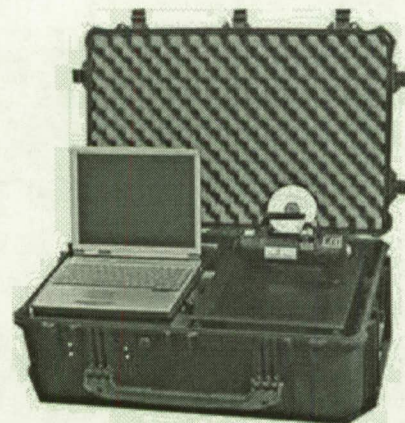


There are three proposed methods for NDE inspection of these orbitally arc welded tube welds:

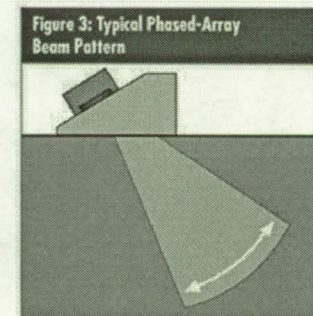
-Digital X-ray

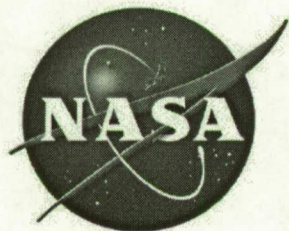


-Pulsed X-ray



-Phased Array Ultrasonic Testing (PAUT)





Requested Budget

	<u>FYFY10</u>	<u>FY 11</u>	<u>FY 12</u>
Civil Servant Salaries	<u>\$0</u>	\$0	\$0
Civil Servant Travel	<u>5K</u>	5K	5K
Procurement	<u>25 K</u>	<u>50 K</u>	<u>75 K</u>
Contract or (AS RC) Task Order (lab or)	<u>\$0</u>	\$0	\$0
Contract or (AS RC) Materials	<u>\$0</u>	\$0	\$0
TOTAL Budget Requested	<u>30 K</u>	55K	80K

Workforce

Direct Civil Service (FTEs)	0.0	0.0	0.0
On-Site Direct Contractor Work Year Effort (WYE)	0.0	0.0	0.0